Distributed Database Access with FroNtier

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GDM

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FroNtier

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- **Goal: Assemble a toolkit, using standard web technologies, to provide high performance, scalable, database access through a multi-tier architecture.**

- **Pilot project Ntier tested the technology:**
  - **Tomcat, HTTP, Squid**
  - **Client monitoring w/ existing CDF tools (udp messages)**

- **Completed a working system for CDF vertical slice test with all needed components March 1. Additional features were added for production-like testing during May. Production version being built now.**

- **http://whcdf03.fnal.gov/ntier-wiki/FrontPage**

A Multi-tier Architecture

- Database (Oracle, MySQL, etc.)
- Database Access Layer
  - Tomcat: servlet management engine
  - JDBC: Database connection
  - Database Connection pool management
- Caching and proxy layer
  - Can provide some caching in the Tomcat server if needed
  - Squid: well known, widely used, highly configurable, caching proxy server
  - Others available, e.g. Netscape.
- Client:
  - Use HTTP library, like cURL / lib
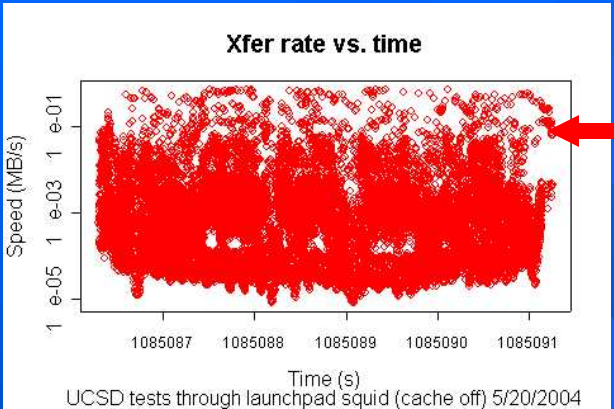 - Parse the payload, either base64, ascii, or binary format.
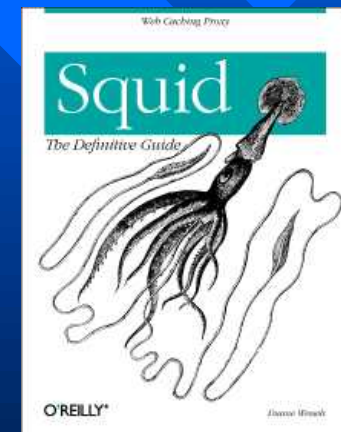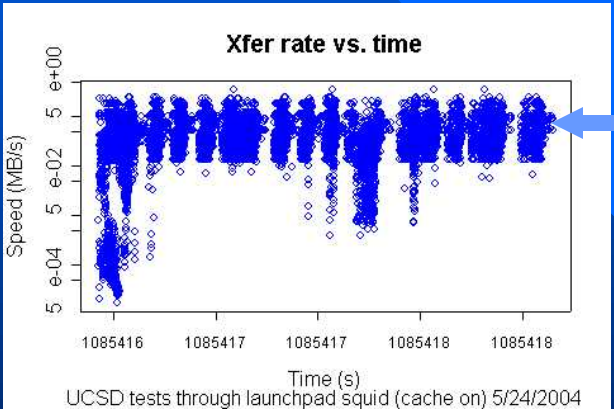
System Hardware Layout
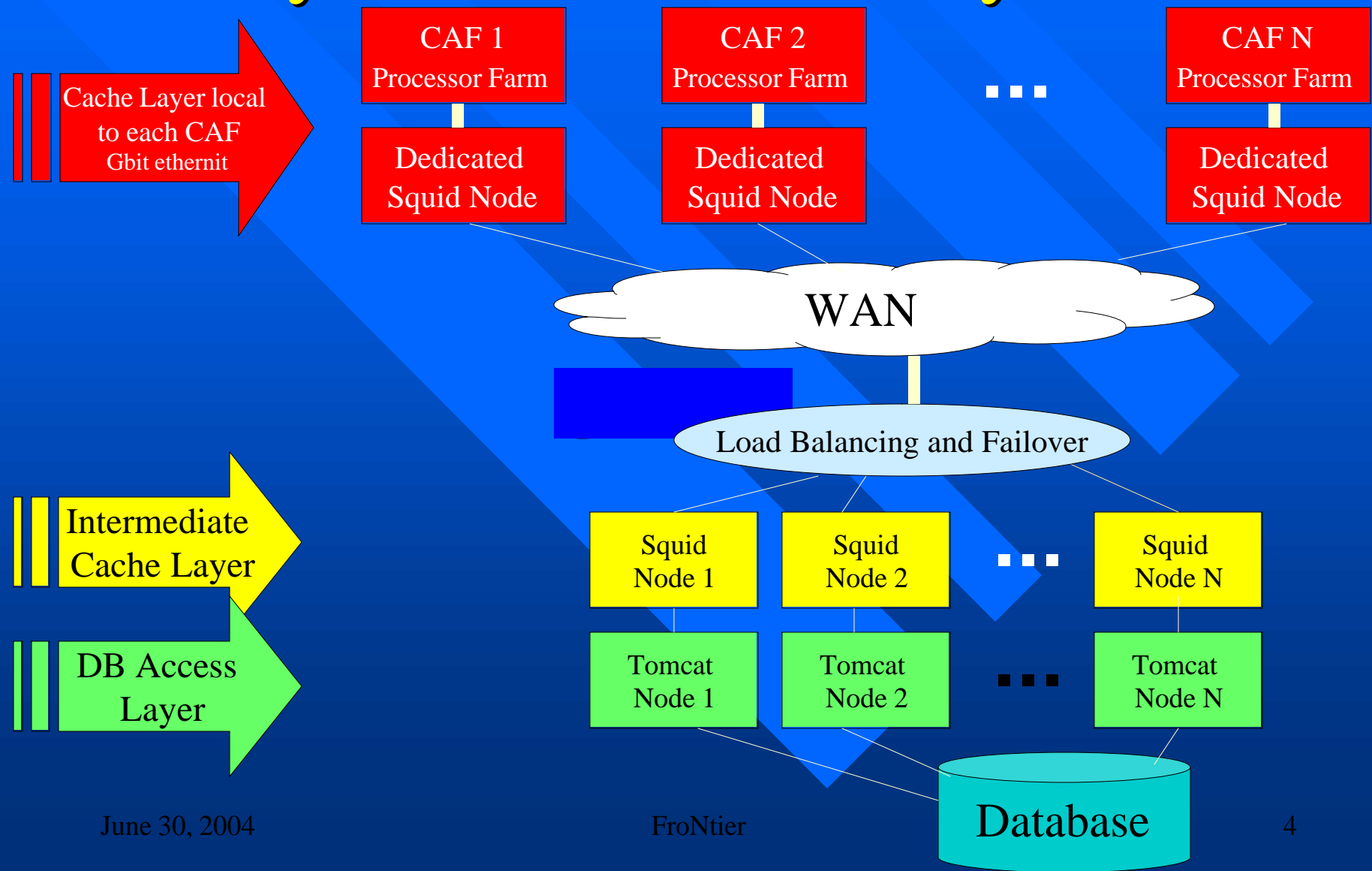
FroNtier Testing at FNAL/SDSC
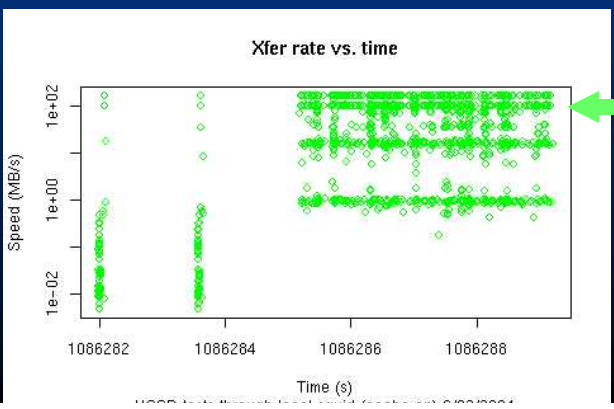
(San Diego Super Computing Center)

0.1 MB/s

No Caching

5 MB/s

Caching at FNAL Launchpad
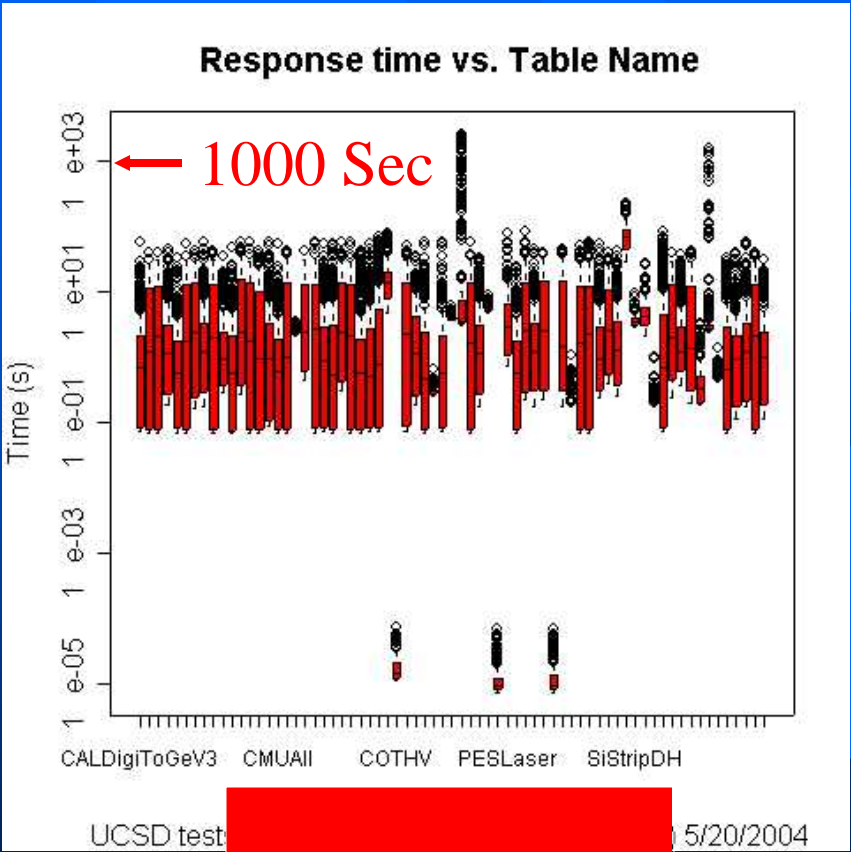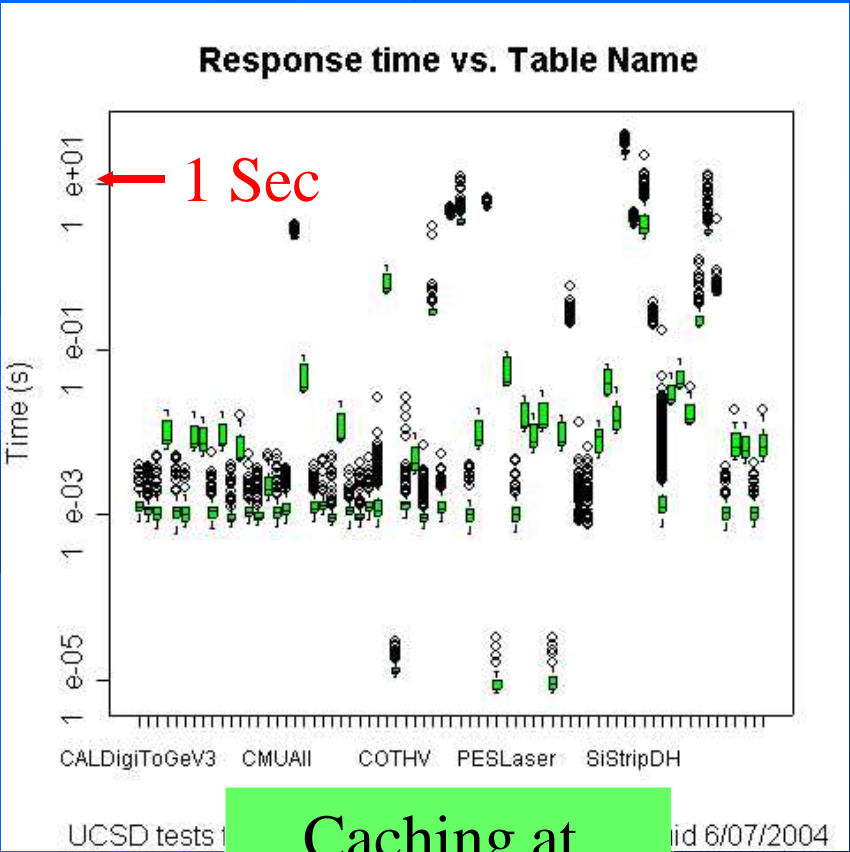

100 MB/s

Caching local to SDSC

SDCS CAF

SDSC Squid

FNAL Launchpad

CDF Oracle

5
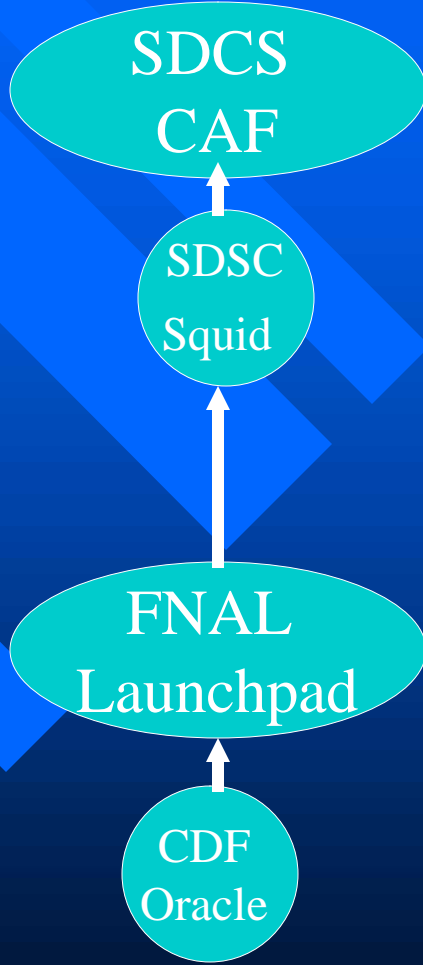
Client Side: FNAL/SDSC

1000 Sec ←

No Caching

1 Sec ←

Caching at SDSC Squid

What's Next on the FroNtier?

- CDF Production ready ~August 1
  - Production Server and client library are being tested now.
  - Test squid performance under full cache (~10 GB).
  - Test launchpad under stress with many concurrent (10-1000) clients.
  - Provide "sizing advice" for CDF production hardware.
- Creating a POOL plug-in for FroNtier and testing for CMS was discussed at CMS Week (June 7-11). Looking at late summer time-frame.
- Interest shown by BTeV at their Software Workshop (June 23). No specific plans discussed.

What's Next on the FroNtier?

- **Discovery Mechanisms**
  - CDF uses client configuration files.
  - More dynamic discovery mechanisms are available: UDDI – Universal Description, Discovery, and Integration.
  - Configuration changes could be handled transparently at the cost of some additional complexity.

- **Monitoring**
  - Squid provides several monitoring and statistics tools: Web-based, SNMP, access logs.
  - Tomcat has limited monitoring tools for servlets.
  - We're developing a simple framework to collect all the information to a central "dashboard".

- **Write clients**
  - Servlets can also be built which will write **to** the database.
  - Requisite authentication mechanisms are available.